SECTION 5A

STRUCTURAL STEEL

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1 Federal Specifications (Fed. Spec.):

TT-P-86G	Paint, Red-Lead-Base, Ready-Mixed
TT-P-615d & Am-3	Primer Coating: Basic Lead Silico Chromate, Ready Mixed
TT-P-645A	Primer, Paint, Zinc-Chromate, Alkyd Type

1.2 American Institute of Steel Construction (AISC) Publications:

Specification for the Design, Fabrication and Erection of Structural Steel for Buildings (Nov 1, 1978, with Commentary)

Specification for Structural Joints Using ASTM A 325 or A 490 Bolts (Aug 14, 1980)

1.3 American National Standards Institute (ANSI) Standards:

B18.22.1-1965 (R 1975)	Plain Washers
B46.1-1978	Surface Texture (Surface Roughness, Waviness and Lay)

American Society for Testing and Materials (ASTM) Publications:

A 6-82a	General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use
A 36-81a	Structural Steel
A 53-82	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A 307-82a	Carbon Steel Externally Threaded Standard Fasteners
A 325-82	High-Strength Bolts for Structural Steel Joints
A 490-82	Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength

A 500-82a	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
A 501-81	Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
A 563-82	Carbon and Alloy Steel Nuts
A 572-82	High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality

American Welding Society (AWS) Publication:

D1.1-82	Structural Welding Code - Steel

2. GENERAL REQUIREMENTS: The AISC Specification for the Design, Fabrication & Erection of Structural Steel for Buildings shall govern the work. Welding shall be in accordance with AWS Code D1.1. High-strength bolting shall be in accordance with the AISC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

3. SUBMITTALS:

3.1 Certificates of Compliance: Certificates of compliance shall be submitted in accordance with the SPECIAL PROVISIONS. Certified copies of mill test reports shall be furnished for structural steel. Certification that each welder is qualified in accordance with AWS Code D1.1 shall be provided.

3.2 Shop Drawings: Shop drawings shall be submitted for approval in accordance with the SPECIAL PROVISIONS. Drawings shall include all shop and erection details. Members and connections for any portion of the structure not shown on the contract drawings shall be detailed by the fabricator and indicated on the shop drawings. All welds shall be indicated by standard welding symbols of the AWS.

4. RESPONSIBILITY FOR ERRORS: The Contractor shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members.

5. STORAGE: Material shall be stored out of contact with the ground in such manner and location as will minimize deterioration.

6. MATERIALS shall conform to the following requirements:

Structural Steel:

6.1.1 Carbon Grade Steel: ASTM A 36.

6.1.2 High-Strength Low-Alloy Steel: ASTM A 572, Grade 50.

Structural Tubing: ASTM A 500, Grade B, ASTM A 501.

Steel Pipe: ASTM A 53, Type E or Type S as indicated, Grade B.

6.4 Paint: Fed. Spec. TT-P-86, Type I or II; TT-P-615, Type I, II, or V; or TT-P-645.

6.5 High-Strength Bolts: ASTM A 325 or A 490 as indicated including nuts and washers.

Carbon Steel Bolts: ASTM A 307, Grade A.

Carbon Steel Nuts: ASTM A 563, Grade A, Heavy Hex Style.

6.8 Plain Washers, Other Than Those in Contact With High-Strength Bolts: ANSI B18.22.1, Type B.

7. FABRICATION shall be in accordance with the applicable provisions of the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings. Fabrication and assembly shall be done in the shop to the greatest extent possible. Compression joints depending on contact bearing shall have a surface roughness not in excess of 500 micro inches as determined by ANSI B46.1, and ends shall be square within the tolerances for milled ends specified in ASTM A 6. Structural steelwork, except surfaces to be field welded, and contact surfaces of friction-type high-strength bolted connections shall be prepared for painting in accordance with the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings and primed with the specified paint.

8. ERECTION of structural steel shall be in accordance with the applicable provisions of the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

8.1 Connections: Anchor bolts and other connections between the structural steel and foundations shall be provided and shall be properly located and built into connecting work.

8.2 Base Plates and Bearing Plates: Column base plates for columns and bearing plates for beams, girders, and similar members shall be provided. Base plates and bearing plates shall be provided with full bearing after the supported members have been plumbed and properly positioned, but prior to placing superimposed loads. Separate setting plates under column base plates will not be permitted. The area under the plate shall be dry-packed solidly with bedding mortar as specified in SECTION: CONCRETE FOR BUILDING CONSTRUCTION.

8.3 Field Welded Connections: Field welded structural connections shall be completed before load is applied. Field welding of structural steel frames shall be tested by the Contractor. The Contractor may elect to shop weld joints indicated as field welds and field weld joints indicated as shop welds. The Contractor shall clearly indicate shop and field welded connections on the shop drawings. Testing of field welded stiffeners or shear connections will not be required.

8.3.1 Testing: Non-destructive testing shall be by ultrasonic methods. The minimum extent of testing shall be a random 50 percent of the field welds. The Contracting Officer will select the welds to be tested. Each

test shall consist of inspecting the entire field weld for both the top and bottom flange of the joint. The web will not be required to be tested.

8.3.2 Corrections and Repairs: When testing indicates defects in the weld joints, the welds shall be repaired by the Contractor at no additional expense to the Government. Corrections shall be in accordance with the applicable requirements of AWS D1.1. After a defect is thought to have been removed, and prior to rewelding, the area shall be examined by suitable methods to insure that the defect has been eliminated. Repair welds shall meet the inspection requirements for the original welds. Any indication of a defect shall be regarded as a defect unless re-evaluation by ultrasonic testing and by surface conditioning shows that no acceptable defect is present.

8.4 Field Priming: After erection, the field bolt heads and nuts, field welds, and any abrasions in the shop coat shall be cleaned and primed with paint of the same quality as that used for the shop coat.